WHAT IS CLAIMED IS:

1.   A system for transmitting a three-dimensional digital image over a communication network, comprising:

a) an image storage device for storing a three-dimensional digital image;

b) a client computer coupled to the communication network, wherein the client computer generates a request for interaction with the three-dimensional image stored on the image storage device, the request identifying a region of interest within the three-dimensional digital image; and

c) a server computer coupled to the communication network and the image storage device, wherein the server computer performs the steps of:

i) performing two-dimensional sub-band transform decompositions in x-axis and y-axis directions upon the three-dimensional digital image;

ii) performing a one-dimensional sub-band transform decomposition in a z-axis direction upon a portion of the two-dimensionally transform-decomposed digital image; and

iii) progressively transmitting to the client computer data representing the identified region of interest within the three-dimensional digital image.

2.   The system of claim 1, further comprising the step of transmitting to the client computer data representing thumbnail-resolution images resulting from the two-dimensional sub-band transform decompositions.

3.   The system of claim 1, wherein the step of performing a one-dimensional sub-band transform decomposition in a z-axis direction comprises:

a) computing transform coefficients using integer arithmetic and not floating-point arithmetic; and

b) correcting the computed transform coefficients by performing integer arithmetic operations with one or more predetermined correction factors.

4. The system of claim 3, wherein the steps of performing sub-band transform decompositions comprise computing transform coefficients for each of a predetermined plurality of resolutions, and the transform coefficients for an Nth resolution of the plurality is computed in response to a one transform formula if N is odd and another transform formula if N is even.

5. The system of claim 4, wherein the server computer scales the transform coefficients by alternating factors of $\sqrt{2}$ and 1 along the z-axis.

6. A system for transmitting a three-dimensional digital image over a communication network, comprising:

   a) an image storage device for storing a three-dimensional digital image;

   b) a client computer coupled to the communication network, wherein the client computer generates a request for interaction with the three-dimensional image stored on the image storage device, the request specifying a quality threshold and including a request list specifying data blocks that define a region of interest within the three-dimensional digital image; and

   c) a server computer coupled to the communication network and the image storage device, wherein the server computer, in response to the request list, transmits to the client computer a number of data blocks corresponding to the specified quality threshold.

7. The system of claim 6, wherein the server computer maps luminance of the three-dimensional image stored on the image storage device from a predetermined image bit depth to a predetermined screen bit depth in accordance with a monotonic luminance mapping function.

8. The system of claim 7, wherein:

   a) the server computer computes a root mean square (RMS) increasing factor defined by a maximal derivative of the luminance mapping function; and

   b) the server computer provides a number of data blocks greater than a predetermined number if the RMS increasing factor is greater than one.

9.   The system of claim 7, wherein:

a) the server computer computes a root mean square (RMS) increasing factor

defined by a maximal derivative of the luminance mapping function; and

b) the server computer provides a number of data blocks less than a

predetermined number if the RMS increasing factor is less than one.

10.   The system of claim 7, wherein:

a) the request generated by the client computer further specifies a resolution;

and

b) the server computer provides a number of data blocks corresponding to the

specified quality threshold and resolution.

11.   A method for transmitting a three-dimensional digital image over a

communication network, comprising:

a)   storing a three-dimensional digital image within an image storage

device;

b)   a client computer coupled to the communication network generating a

request for interaction with the three-dimensional image stored on the

image storage device;

c)   a server computer coupled to the communication network performing

two-dimensional sub-band transform decompositions in x-axis and y-

axis directions upon the three-dimensional digital image;

d)   the server computer performing a one-dimensional sub-band transform

decomposition in a z-axis direction upon a portion of the two-

dimensionally transform-decomposed digital image; and

e)   the server computer progressively transmitting to the client computer via

the communication network data representing the identified region of

interest within the three-dimensional digital image.

12.   The method of claim 11, further comprising the step of transmitting to the client

computer data representing thumbnail-resolution images resulting from the two-

dimensional sub-band transform decompositions.

13.   The method of claim 11, wherein the step of performing a one-dimensional sub-band transform decomposition in a z-axis direction comprises the steps of:

a) computing transform coefficients using integer arithmetic and not

floating-point arithmetic; and

b) correcting the computed transform coefficients by performing integer

arithmetic operations with one or more predetermined correction factors.

14.   The method of claim 13, wherein the steps of computing sub-band transform decompositions comprise computing transform coefficients for each of a predetermined plurality of resolutions, and the transform coefficients for an Nth resolution of the plurality is computed in response to a one transform formula if N is odd and another transform formula if N is even.

15.   The method of claim 14, wherein the server computer scales the transform coefficients by alternating factors of $\sqrt{2}$ and 1 along the z-axis.

16.   A method for transmitting a three-dimensional digital image from a server computer to a client computer over a communication network, comprising the steps of:

a) storing a three-dimensional digital image on an image storage device;

b) the client computer generating a request for interaction with the three-

dimensional image stored on the image storage device, the request specifying a

quality threshold and including a request list specifying data blocks that define a

region of interest within the three-dimensional digital image; and

c) transmitting from the server computer to the client computer, via the

communication network, a number of data blocks corresponding to the specified

quality threshold.

17.   The method of claim 16, further comprising the step of the server computer mapping luminance of the three-dimensional image stored on the image storage device from a predetermined image bit depth to a predetermined screen bit depth in accordance with a monotonic luminance mapping function.

18. The method of claim 17, further comprising the steps of:

a) the server computer computing a root mean square (RMS) increasing factor defined by a maximal derivative of the luminance mapping function; and

b) the server computer providing a number of data blocks greater than a predetermined number if the RMS increasing factor is greater than one.

19. The method of claim 17, further comprising the steps of:

a) the server computer computing a root mean square (RMS) increasing factor defined by a maximal derivative of the luminance mapping function; and

b) the server computer providing a number of data blocks less than a predetermined number if the RMS increasing factor is less than one.

20. The method of claim 17, further comprising the steps of:

a) including in the request generated by the client computer a specified resolution; and

b) providing a number of data blocks from the server computer that correspond to the specified quality threshold and resolution.

21. A computer program product for communicating a three-dimensional digital image over a communication network, the three-dimensional image stored on an image storage device accessible via the communication network, the computer program product comprising one or more computer data media carrying thereon:

a) a client portion effecting a client computer request for interaction with the three-dimensional image stored on the image storage device, the request identifying a region of interest within the three-dimensional digital image; and

b) a server portion effecting in a server computer the steps of:

i) performing two-dimensional sub-band transform decompositions in x-axis and y-axis directions upon the three-dimensional digital image;

ii) performing a one-dimensional sub-band transform decomposition in a z-axis direction upon a portion of the two-dimensionally transofrm-decomposed digital image; and

iii) progressively transmitting to the client computer via the communication network data representing the identified region of interest within the three-dimensional digital image.

22.   The computer program product of claim 21, wherein the server portion further effects in the server computer a step of transmitting to the client computer data representing thumbnail-resolution images resulting from the two-dimensional sub-band transform decompositions.

23.   The computer program product of claim 21, wherein the step of performing a one-dimensional sub-band transform decomposition in a z-axis direction comprises:

      a) computing transform coefficients using integer arithmetic and not floating-point arithmetic; and

      b) correcting the computed transform coefficients by performing integer arithmetic operations with one or more predetermined correction factors.

24.   The computer program product of claim 23, wherein the steps of performing sub-band transform decompositions comprise computing transform coefficients for each of a predetermined plurality of resolutions, and the transform coefficients for an Nth resolution of the plurality is computed in response to a one transform formula if N is odd and another transform formula if N is even.

25.   The computer program product of claim 24, wherein the server portion effects in the server computer a step of scaling the transform coefficients by alternating factors of $\sqrt{2}$ and 1 along the z-axis.

26.   A computer program product for communicating a three-dimensional digital image over a communication network, the three-dimensional image stored on an image storage device accessible via the communication network, the computer program product comprising one or more computer data media carrying thereon:

      a) a client portion effecting a client computer request for interaction with the three-dimensional image stored on the image storage device, the request

70

specifying a quality threshold and including a request list specifying data blocks that define a region of interest within the three-dimensional digital image; and

b) a server computer portion effecting in a server computer, in response to the request list, transmission to the client computer of a number of data blocks corresponding to the specified quality threshold.

27. The computer program product of claim 26, wherein the server portion effects in the server computer a step of mapping luminance of the three-dimensional image stored on the image storage device from a predetermined image bit depth to a predetermined screen bit depth in accordance with a monotonic luminance mapping function.

28. The computer program product of claim 27, wherein:
a) the server portion effects in the server computer a step of computing a root mean square (RMS) increasing factor defined by a maximal derivative of the luminance mapping function; and
b) the server portion effects in the server computer a step of providing a number of data blocks greater than a predetermined number if the RMS increasing factor is greater than one.

29. The computer program product of claim 27, wherein:
a) the server portion effects in the server computer a step of computing a root mean square (RMS) increasing factor defined by a maximal derivative of the luminance mapping function; and
b) the server portion effects in the server computer a step of providing a number of data blocks less than a predetermined number if the RMS increasing factor is less than one.

30. The computer program product of claim 27, wherein:
a) the client computer request further specifies a resolution; and
b) the server portion effects in the server computer a step of providing a number of data blocks corresponding to the specified quality threshold and resolution.